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SELECTED TRANSLATIONS ON SCIENCE IN KAZAKH, U. S. S. R.

- Russia -

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FOREWORD

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SELECTED TRANSLATIONS ON SCIENCE IN KAZAKH, U. S. S. R.

Following is a translation of selected articles from an issue of the Russian-language periodical Vestnik Akademii Nauk Kazakhskoy S.S.R. (Herald of the Academy of Sciences), Alma-Ata, Kazakh, U.S.S.R., No. 1 (178), 1960/

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I. USING RADIOACTIVE ISOTOPES

The Surveying Division of the Institute of Mining, Academy of Sciences, Kazakh S. S. R. proposed and developed a new method of remote observations of the displacement of rocks in a stratum of a massif using radioactive isotopes.

Before crosscutting of the massif and displacement therein to the stratum of rocks, a radioactive substance (cobalt 60) is inserted into the walls of specially sunk vertical shafts (bore holes, pits, etc.) at fixed depths by means of a special projectile. A measuring device is then used to determine the original position of the points with radioactive cobalt, which is reflected in a sharp increase in the number of impulses per unit of time, i.e., in the form of distinct "peaks" on the gamma-impulse curves. Then the marks of the subsurface labeled points are connected with the mark of the surface geodetic datum mark located outside the displacement zone of the rocks. The subsurface datum marks are determined with an accuracy of ± 6 mm. Later, systematic observations of the position of points within the massif are carried out during the entire period of displacement of the overlying stratum of rock.

Observations by the radioactive isotope method make it possible to obtain a factual picture of the dislocation of the crosscut layers directly in the stratum at any depth desired.

We are now using this method in various parts of the Karaganda Basin for observations at eight subsurface observation stations.

II. INVESTIGATING THE PROBLEMS OF THE FISH INDUSTRY

By decree of the Presidium of the Academy of Sciences, Kazakh S. S. R., an Institute of Ichthyology and Fish Industry was organized from the Division of Ichthyology and Hydrobiology of the Institute of Zoology in the city of Gur'yeva.

The new Institute consists of seven laboratories-ichthyology, hydrobiology, hydrology and hydrochemistry, pisciculture, melioration, embryology and physiology, catching and technology of fish production - and an experimental breeding unit.

The Institute of Ichthyology and Fish Industry has three branches (Aral, Balkhash, and Altay) with laboratories and an ichthyological control point in the City of Dzhezkazgan.

The long-range plan of the Institute calls for investigation of just one major problem - "Biological foundation for the development, efficient exploitation, and reproduction of fish resources in the waters of Kazakhstan".

The Institute intends to conduct an ichthyological and hydrobiological study of the main industrial waters (Aral Sea, Balkhash, Zaysan, Ural River, etc.), as well as the bodies of water not utilized by the fish industry.

It will endeavor to solve the problems involved in reconstituting the ichthyofauna and fodder invertebrates by acclimatizing new species; elaboration of efficient methods of fishing using modern techniques and organization; study of ways to increase fish productivity by improving and streamlining the industry; perfecting the technology of preparing fish products, fodder meal, and many other things. The Institute is working in close cooperation with personnel of the Gur'yeva combine and scientists of the KASPNIRO.

The Institute of Ichthyology and Fish Industry of the Academy of Sciences, Kazakh S. S. R. provides practical assistance to the fish industry of the republic in organizing a highly productive fish industry and protecting the fish resources of Kazakhstan's waters.

III. AN APPARATUS TO MEASURE THE DUSTINESS OF AIR

The dust laboratory of the Institute of Mining has developed a new dust meter (M. I. Volokhov and G. I. Boyarkin). The device is based on the principle of dust settling in a high-tension electrical field. It has been designed to measure the dustiness of air in industrial establishments, mines, and atmosphere and to collect samples of dust in connection with various kinds of investigations - dispersed composition, chemical analysis, etc.

An electrical precipitator is mounted in an aluminum frame measuring 180 x 350 x 120 mm and it weighs 4.2 kg. All the units are assembled inside the frame: dust catcher and filter, motor with fan, register of amount of air.

The apparatus is capable of measuring the dust concentration of any kind of material; the measurement range is from 0.3 to 1000 mg/m³.

The process of collecting and treating the samples is as follows. The apparatus is placed on a stand at the measuring point, the current turned on, and the desired capacity of the fan regulated with a manual rheostat. The apparatus operates for the necessary period of time with a record kept of the time it is turned on and turned off.

To determine the concentration of dust in the air, settling electrodes (metal tubes) with the dust deposited on them are weighed on analytical scales. The dust is then wiped off the tubes with dry cotton and the tubes again weighed. The difference between the results of the weighing divided by the amount of air that passed through when the sample was collected is the dust content in a volumetric unit of the air under investigation. The amount of air is shown by the arrow of the indicator.

This electrical precipitator has substantial advantages over apparatus based on the standard method of dust control. It is mounted in a single frame and is readily portable. No stationary supply source is required when samples are being collected. Collection time is halved; processing time is more than ten times quicker. Processing of a sample collected by an electrical precipitator merely involves a double weighing of the preparation. Results of the analysis can be obtained within a few minutes of the time the sample is brought into the laboratory. The device is cheaper to use because fewer people in the dust laboratory are needed and because it can be used along with analytical scales even if there is no laboratory available.

A few experimental devices are now being manufactured by the Alma-Ata electrical engineering plant.